Solutions: Conditional Probability and Independence Checkpoint 1

The first three questions refer to the following information:

Suppose a basketball team had a season of games with the following characteristics:

- 60% of all the games were **at-home** games. Denote this by **H** (the remaining were **away** games).
- 25% of all games were **wins**. Denote this by **W** (the remaining were **losses**).
- 20% of all games were at-home wins.

Question 1

Select one answer.
10 points

Of the at-home games, we are interested in finding what proportion were wins. In order to figure this out, we need to find:

- (a) P(H)
- (b) P(W)
- (c) P(H and W)
- (d) P(H | W)
- (e) P(W | H)

Correct answer: (e)

Question 2

Select one answer.
10 points

Of the at-home games, what proportion of games were wins? (Note: Some answers are rounded to two decimal places.)

- (a) .12
- (b) .15
- (c) .20
- (d) .33
- (e) .42

Correct answer: (d)

Question 3

Select one answer.
10 points

If the team won a game, how likely is it that this was a home game? (Note: Some answers are rounded to 2 decimal places.)

- (a) .05
- (b) .12
- (c) .15
- (d) .42
- (e) .80

Correct answer: (e)

Question 4

Select one answer.
10 points

Let A and B be two independent events. If P(A) = .5, what can you say about P(A | B)?

- (a) Cannot find it since P(B) is not known.
- (b) Cannot find it since P(A and B) is not known.
- (c) Cannot find it since both P(B) and P(A and B) are not known.
- (d) It is equal to .5.
- (e) It is equal to .25.

Correct answer: (d)

Question 5

Select one answer.
10 points

Dogs are inbred for such desirable characteristics as blue eye color; but an unfortunate by-product of such inbreeding can be the emergence of characteristics such as deafness. A 1992 study of Dalmatians (by Strain and others, as reported in *The Dalmatians Dilemma*) found the following:

(i)	31% of all Dalmatians have blue eyes.
(ii)	38% of all Dalmatians are deaf.
(iii)	42% **of blue-eyed Dalmatians** are deaf.

Based on the results of this study is "having blue eyes" independent of "being deaf"?

- (a) No, since .31 * .38 is not equal to .42.
- (b) No, since .38 is not equal to .42.
- (c) No, since .31 is not equal to .42.
- (d) Yes, since .31 * .38 is not equal to .42.
- (e) Yes, since .38 is not equal to .42.

Correct answer: (b)

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